An Introduction to MorphOS

PowerPC™

Updated to include features to version 1.4.5

May 14, 2005

MorphOS 1.4

This presentation gives an overview of MorphOS and the features that are present in the MorphOS 1.4 shipping product.

For a fully comprehensive list please see the "Full Features list" which can be found at:

www.PegasosPPC.com

Why MorphOS?

Modern Operating Systems are powerful, flexible and stable tools. For the most part, if you know how to look after them, they do their job reasonably well.

But, they are just tools to do a job. They've lost their spark, they're boring.

A long time ago computers were fun, it is this background that MorphOS came from and this is what MorphOS is for, making computers fun again.

What is MorphOS?

MorphOS is a fully featured desktop Operating System for PowerPC CPUs. It is small, highly responsive and has very low hardware requirements.

The overall structure of MorphOS is based on a new modern kernel called Quark and a structure divided into a series of "boxes". This system allows different OS APIs to be used along side one another but isolates them so one cannot compromise the other.

To make sure there is plenty of software to begin with the majority of development to date has been based on the A-BOX.

In the future the more advanced Q-Box shall be added.

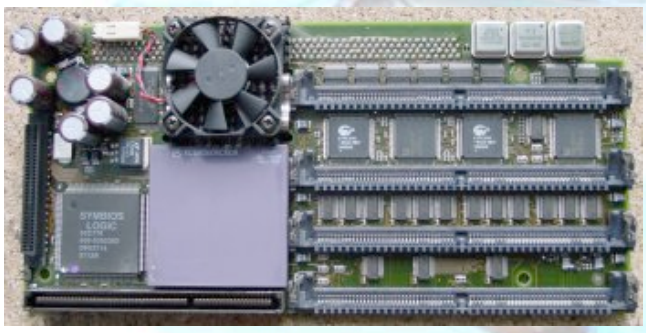
Compatibility

The A-Box is an entire PowerPC native OS layer which includes source and binary compatibility with software for the Commodore A500 / A1200 etc. series of computers including full compatibility with OS v3.1 and partial compatibility with v3.5 and v3.9.

There are many thousands of applications for these systems and more are in development.

An Experienced Team

The developers of MorphOS have been developing software and hardware for these computers for a long time. When Amiga Technologies GmbH first floated the idea of using the PowerPC series of CPUs it was a company called Phase5 that they turned to.



Later Amiga Technologies folded but in 1997 Phase5 became the first and only company to offer PowerPC upgrades. It is these very same engineers and developers now at Genesi who today bring you MorphOS and the Pegasos hardware it runs on.

What is MorphOS not?

MorphOS is not an Emulator

A fast "JIT" emulator is built-in but this is only used for 68K based applications. All of MorphOS itself is native and thus gets the full benefit of the modern PowerPC CPUs.

MorphOS is not a Clone

While it includes compatibility with legacy systems and can run older applications it is also enhanced with functionality that goes well beyond the original allowing applications to be enhanced becoming better than ever.

And beyond…

In the future a completely new fully protected OS structure and modern API and functionality will be added. The foundations for this are already present in MorphOS.

CPU Emulation

In order to be compatible with binary applications from the original A500, A1200 etc. systems, an emulator for the “68K” series CPUs used in those computers is included in MorphOS.

The Trance emulator is JIT (Just in Time) based. This translates 68K code to PPC code then keeps translated code in memory so no re-translation is required. This speeds up emulation allowing 68K programs to run at up to 75% of native PowerPC CPU speed, this is much faster than the fastest 68K CPU ever made.

For maximum performance applications should of course be recompiled for PowerPC but this is usually a minor task.

Additional Compatibility

3rd party APIs are also supported including:

PowerPC extensions:

- PowerUP
- WarpUP

2D / 3D Graphics APIs:

- CyberGraphX
- Rave
- Warp3D

Audio:

- Audio Hardware Interface (AHI)

GUI:

- Magic User Interface (MUI)

In-Compatibility

Bad Behavior

Some programs on these systems depend on undocumented behavior or behave strangely so in some cases workarounds have been added to allow programs to run.

While these may sound like hacks they increase compatibility allowing the user to access applications that otherwise wouldn't be available. If you want full compatibility you have to do this as some programs do not play by the rules or rely on unusual behavior.

No Behavior

Some programs will definitely not run, these are mainly games and demos which use the graphics hardware directly. This hardware is not present and is not emulated in MorphOS as the overhead is far too great.

UAE

You can run software which requires the hardware through an emulator called UAE which does support it. A version of this is available for MorphOS.

The Ambient Desktop

The MorphOS desktop is called "Ambient", this is an easy to use true color desktop. The fully asynchronous, multi-threaded design means you can keep working even when it's busy.

- Based on MUI
- Fully skin-able, can be changed on the fly
- Supports various icons formats including PNG (as used by KDE)
- Panels - Launch commonly used programs with a single click
- Lasso for multiple icon selection
- Shortcuts

Graphical User Interface

As well as the the desktop other programs can also use the GUI facilities:

- Screens: Each program can either open on the desktop or open it's own custom screen
- Rapid switching between screens
- Fully skin-able GUI
- Each screen can have it's own individual skin (Several skins are supplied)
- Opaque Window movement
- Off-screen Windows (can be disabled)
- Window iconification
- Requesters with Logos
- Auto-scroll

MUI (Magic User Interface)

MUI is a highly flexible Object Oriented GUI toolkit built into MorphOS which allows the creation of powerful and flexible application user interfaces with minimal effort

- Developers can create external custom classes complete with their own preferences settings
- "Jump Screen" menu function allows you to move your application to another screen
- Bubble help with customizable size and look, with a floating bubble mode
- Configurable menu system, can be embedded in windows
- Uses video memory when possible to improve performance
- Mouse wheel support

Graphics System

Plenty of options to create sophisticated applications with the built in graphical tools:

- Transparency
- Blurring
- Color imposition
- Alpha channels
- Gradients
- Blending
- PNG buttons
- Alpha channelled buttons

Fonts

MorphOS includes the FreeType2 font library.

Anti-Aliasing support makes fonts easier to read.

Selectable type of Anti-Aliasing used (can also be disabled).

Includes support for the following popular font types:

- Type 0
- Type 1
- Type 42
- TrueType
- OpenType

Datatypes

Datatypes allow programs to access different file types without having to write a reader / writer for each type:

Images:

- Jpeg
- Png
- Iff - ilbm
- Gif
- Bmp
- Pcx
- Pbm

Audio:

- Mp3
- Aiff
- Wave
- Iff - 8svx
- Iff - 16sv

Other:

- Ascii text
- Icons
- Binary

File Systems

MorphOS supports many file systems as standard:

- FFS2
- SFS

Emulated:

- PFS
- FFS

CD-ROM File systems:

- ISO9660
- Multisession
- Rockridge
- Joliet

Supported Graphics cards (2D)

ATI

- Radeon 9250
- Radeon 9200(SE)
- Radeon 9000 Pro
- Radeon 8500(LE)
- Radeon 7500
- Radeon 7200
- Radeon 7000VE

3dfx

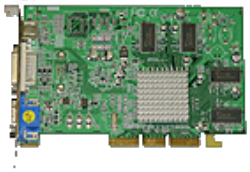
- Voodoo5 (all models)
- Voodoo4 (all models)
- Voodoo3 (all models)

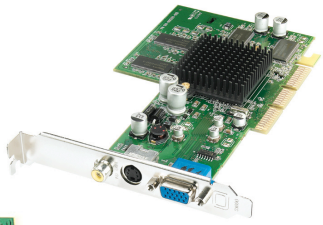
SiS

- 305
- 300
- 6326

3DLabs/TI

- Permedia2
- Permedia2v





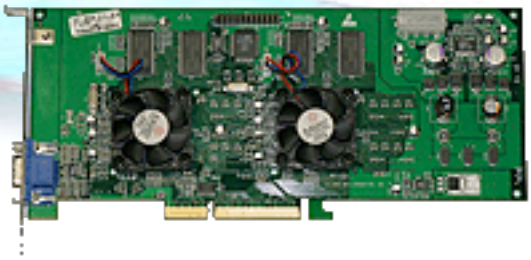
Hardware Accelerated 3D Graphics

Supported hardware:

3dfx

- Voodoo 3
- Voodoo 4
- Voodoo 5

And more in the (graphics) pipeline…

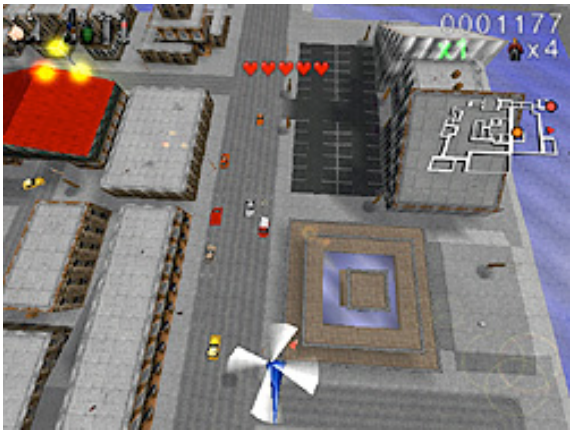


Supported APIs:

Rave

TinyGL (subset of OpenGL)

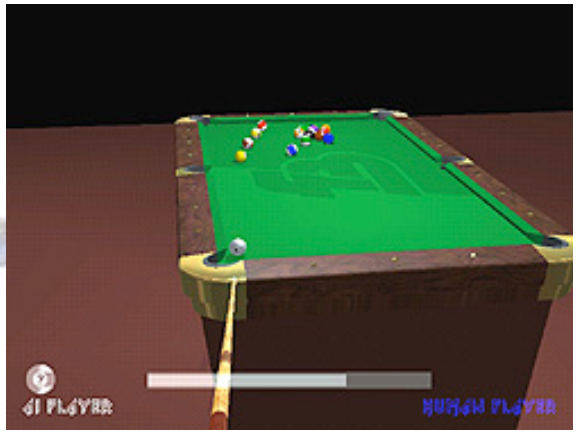
Warp3D

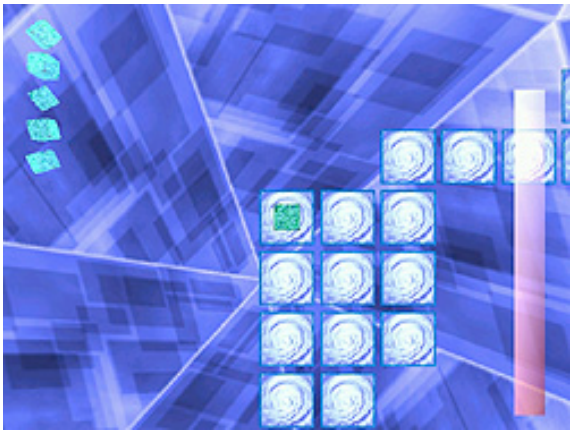


Compatible 3D Games

There are many games running and many more in development here are just some which run already:

- Wipeout 2097
- Heretic 2
- Payback
- GLQuake
- Adescent
- Shogo
- Descent-Freespace
- Quake 2
- Foobillard
- Alybox





Printer Support

The easy to set up printer driver and support package Turboprint v7 is built into MorphOS.

This includes drivers for hundreds of printers including many from:

- Canon
- Epson
- HP
- Lexmark
- Brother
- Citizen

and more...

Hardware Support

Storage:

Standard IDE devices: HD / CD ROM / CD-R / CD-RW / DVD ROM / DVD-/+R / DVD-/+RW

USB Mass storage (includes many digital cameras)

Standard USB devices:

Keyboards, mice, Floppy drives etc.

SCSI:

Symbios 89x (+ current models)

Symbios 810, 815, 825, 875 and Symbios 710, 770

For more details see the FAQs Here:

http://www.morphzone.org/modules/xoopsfaq/

Shell

MorphOS has it’s own shell for command line control:

Built in support for MUICON shell replacement starting in version 1.4.4 (http://binaryriot.com/dreamolers/muicon/)

- Easy to remember commands
- Commands can be made resident in memory for speed
- Tab-completion for commands, files and directories
- Review buffer (with scrollbar)
- Powerful “multi pages” mode allows several shells to run in the same window
- One button switch between or create new shells
- A shell can be detached and reattached to another console
- UNIX style script execution

Memory Protection Features

The original OS did not feature any memory protection so errant programs could cause crashes.

Due to the way the original system works full memory protection cannot be added without breaking compatibility.

Limited memory protection can be added and this has been implemented in the following areas:

- Module ROM
- Zero Page
- Unmapped memory

Additionally, a log server can be activated at boot time for catching and reporting illegal memory access.

Due to the design of MorphOS this is only a problem inside the A-Box, it will not effect the Quark kernel or the Q-Box.

Preferences

You can customise the system to your own preferences using the following supplied preferences programs:

Font

Select screen fonts

Input

Mouse / keyboard settings

ModeEdit

Manage monitors and screen modes

Printer

Select and fine-tune your printers

ScreenMode

Change screen mode parameters

Preferences

SFS

Manage Smart File System

USB

Manage USB devices

MUI

Magic User Interface

IControl

Manage other stuff

Built in Apps

Voyager

Fast Web browser (Removed from current release)

Kaya

mp3 / ogg sound player

MysticView

Multithreaded Image viewer

Multiview

Viewer for Images, sounds and text

APDF

PDF viewer

Built in Apps

Calculator

Scientific calculator (Removed from current release)

Zoom

Magnifying glass.

Task manager

Manage running applications

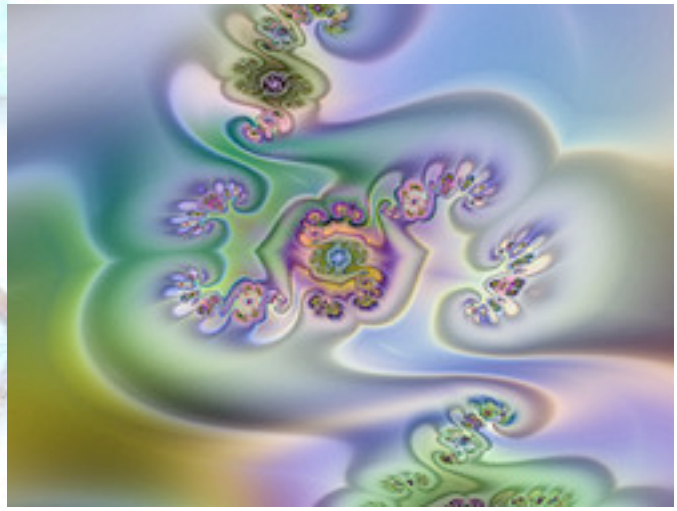
TranceStats

Program showing statistics for the JIT 68k emulator in MorphOS

Images

Brighten up up your desktop with dozens of images:

e.g. Fractals (see **www.Morphzone.org)**



SuperBundle

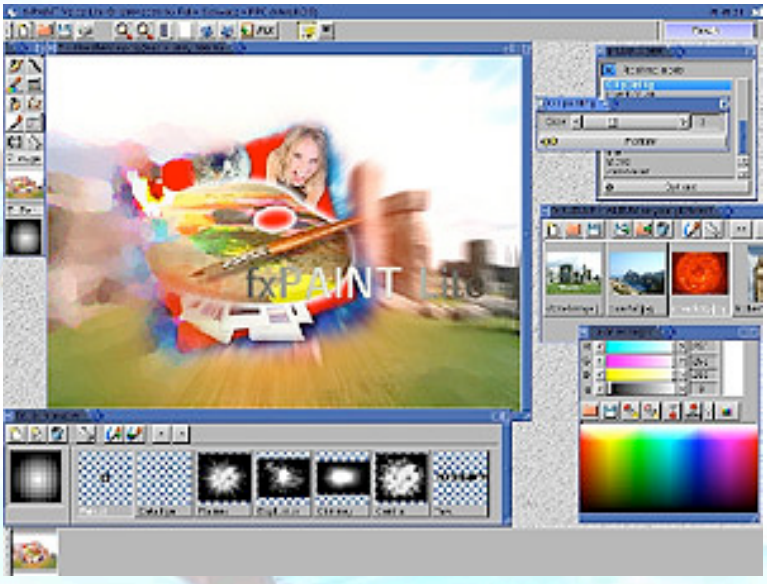
No OS is any use without applications, so Genesi have made available the SuperBundle. This contains a variety of different types of software including Creative & Artistic applications, Utilities, several Games and Software Development tools.

The Superbundle can be purchased at various Pegasos dealers. Its no longer available for download at this time.

SuperBundle

FX Paint Lite

Paint and Image Effects



FX Scan Lite

Scanning software for
different types of scanners

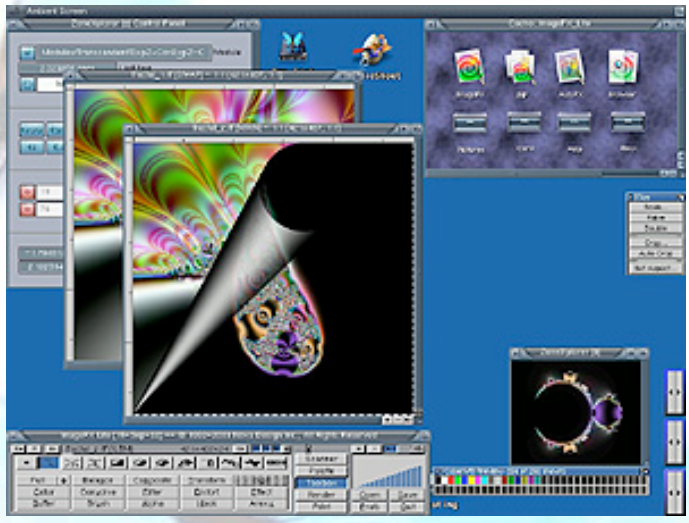
VHI Studio Lite

Import Images and Animations from
various hardware sources

SuperBundle

ImageFX Lite

A special edition of this image editing and manipulation software.



Power Station (for ImageFX)

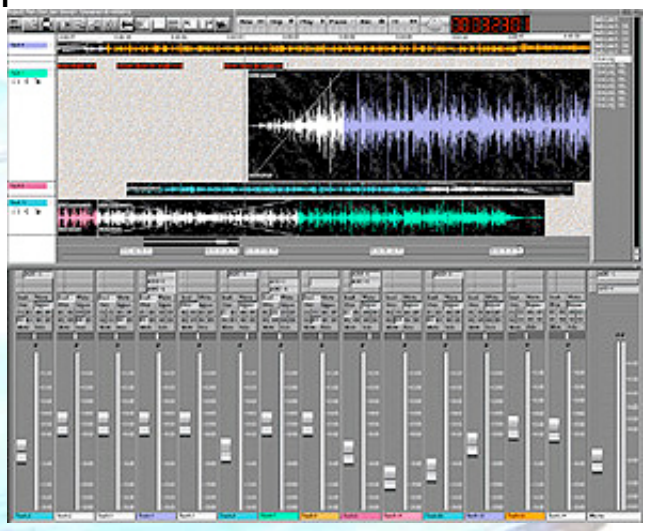
A set of Filters and Renderers for ImageFX including:

- Bubble
- Fire
- Clouds
- Liquid
- Lightning

SuperBundle

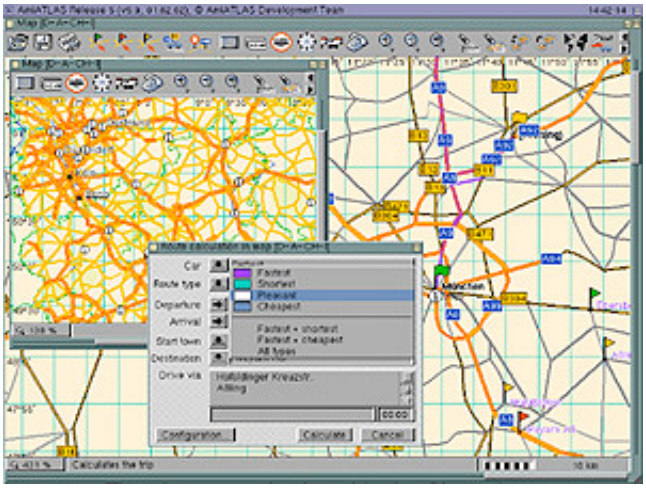
ProStationAudio Still free for ALL Pegasos users. Contact Audio Labs for details. (http://www.audiolabs.it/prostation/)

Record a chart topper with this powerful multitrack hard disc based audio recording system



AmiATLAS

Find out where you are - or where you're going



SuperBundle

If you're not feeling creative you can always try your hand at a game…

Feeble Files

"Rebellion has never looked so pathetic"

Software Tycoon

Are you the next Bill Gates? Find out

SuperBundle

Birdie Shoot

Simple but highly addictive shooting game

Aqua

Just what happened to the shipwrecked oil rig? Jump into your submarine and find out

FotoFoto SE

A modern day take on Spot the difference

SuperBundle

The SuperBundle also includes the following Development Tools:

MorphOS SDK

Official Software Development kit for MorphOS

MorphED

The official MorphOS editor

Inga Lite

Create Graphical Adventures

For Developers

A complete Software Development Kit is available as a free download from MDC with:

- MorphED (Text editor)
- Documentation, example code and articles on the many features of MorphOS
- A complete PowerPC native GCC/GG compiler environment
- The latest release of Barfly PowerPC Assembler
- The latest OpenPCI SDK
- A complete set of MorphOS include files

Developer Community

The MorphOS Developer Connection (MDC)

This is an online conservatory of facts, information, and help. It is an officially sponsored service to help the MorphOS developer create the application of his or her dreams.

Phoenix Developer Consortium

The Phoenix Developer Consortium is a meeting place and a tool for developers. Spanning multiple Operating Systems covering software, hardware and content development.

Pegasos II

MorphOS is supplied with the Pegasos II

Pegasos II Specifications:

MicroATX PowerPC motherboard

Supports IBM & Motorola PowerPC CPUs.

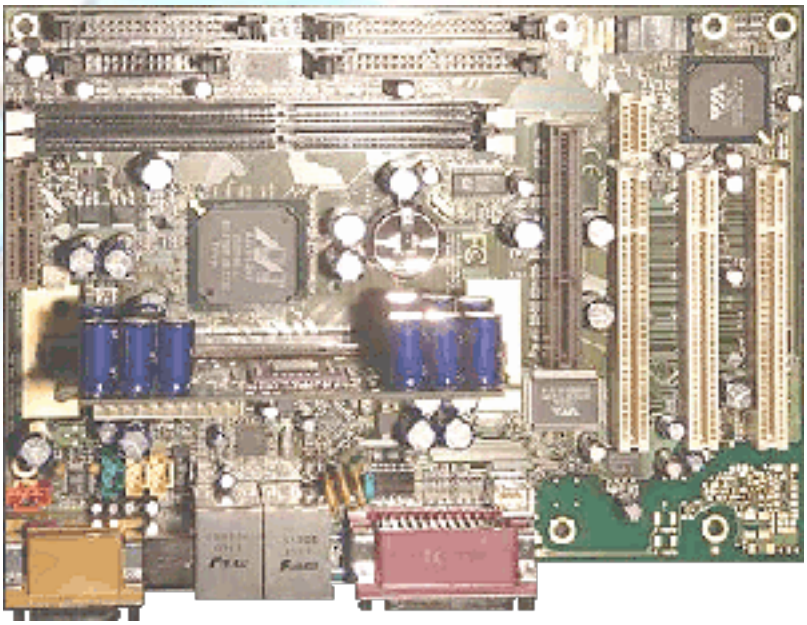
Supports PC2100 DDR RAM

AGP slot

2 Network Ports:

1 x 1Gbit/s

1 x 100Mbit/s



3 x Firewire

4 x USB 1.1

2 x ATA 100

AC97 Audio

SPDIF

OpenFirmware

http://www.pegasosppc.com/purchase.php

Further Information

There are a number of sites where you can get information, news as well as get in touch with the community and developers:

MorphOS Details
www.morphos.net

Pegasos Details
www.pegasosppc.com

MorphOS News & Links
www.morphos-news.com

MorphOS Community
www.morphzone.org

MorphOS Developer Connection
www.developer.morphosppc.com

Phoenix Developer Consortium
www.phinixi.com

The End

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